

the assistance of other forces arising from the motion of the air and the rotation of the earth) the horizontal differences of pressure arising therefrom are the active forces, as I, among others, have explained in the Austrian Z. O. G. M., 1882, p. 91, where (in the foot-note) I have warned against the too frequent overestimation of the influence of the warming of the air at the base.

"We have thus come to the limit where the geographical element is less important than the physical; where climatology passes over into meteorology. Of course, however, climatology is in the highest degree interested in the progress of meteorology since the connection between its individual isolated facts is in great part to be expected from it. Especially is it true that the explanation of the nature and development of atmospheric whirls or, the regions of high and low pressure, their changes with altitude, their origin and disappearance, will be of the greatest importance for climatology as well as for meteorology. Our knowledge of the movement of whirls has made good progress, but as to their changes in intensity we know nothing except some isolated empirical rules and many vague assumptions. In order to make further advance in this matter we need, above all, a more accurate insight into the distribution of temperature and pressure in the higher strata above cyclones and anticyclones. About five years ago Hann published the sensational discovery that in the Alpine region in anticyclones, notwithstanding the great cold at the surface of the soil, the mean temperature of the column of air between this ground and the level of 3,100 meters above the sea, was higher in the centre of anticyclones than in cyclones. A further extension of this investigation to other portions of the world promises further important conclusions. In such work observation and study must go together in order to further the advancement of science."

#### FOG IN NEW YORK HARBOR.

Owing to the clear sky that prevails within areas of high pressure the radiation of heat from the ground or the ocean surface and from the lowest stratum of air, proceeds more rapidly and, as is well known, during such periods mist and fog are formed in the lower air. Radiation proceeds uninterruptedly during the night time from the upper surface of foggy air and the depth of the layer of fog steadily increases, so that oftentimes the heat of the sun, in the middle of the day, is not sufficient to dissipate the fog formed at night. It has often been remarked that the lookout at, or above, the main top overlooks the ocean of fog. In general, a dense fog implies clear sky above it and by attention to the movement of areas of pressure it becomes possible to predict fog on our coast.

On Tuesday, December 17, and Wednesday 18, high pressure prevailed off the middle Atlantic Coast with north-east winds shifting to southwest at New York, N. Y. During Tuesday night and the greater part of Wednesday dense fog prevailed in both the upper and lower bay; the Sound steamers did not attempt to come through Hell Gate; the ocean steamers were detained below quarantine; nothing could be seen at Sandy Hook and all movements were guided by the sound of the fog signals. This fog was attributed by some to the unseasonably warm weather prevailing all along the neighboring coasts. The extreme temperatures were as follows:

Locality.	17th.		18th.	
	Min.	Max.	Min.	Max.
Nantucket .....	32	36	32	50
New York .....	26	42	34	48
Philadelphia .....	26	44	34	50
Atlantic City .....	24	.....	38	.....

These figures do not show any temperatures that are unusually high for this region, neither is the occurrence of fog unusual at this season; it is, in fact, the ordinary accompaniment of areas of high pressure in the winter time over the ocean.

#### SNOWFALL IN NORTH DAKOTA.

With regard to the snowfall in North Dakota, Mr. B. H. Bronson, in his November bulletin says:

The principal feature was the unusually early fall of snow, which became general over the State by the 5th instant, and was very heavy in many localities. Old settlers in this section remark that this early snow is the earliest that has occurred during their residence here, and has rendered the hauling of grain by sleds more practicable than by wagons. The snowfall promises an abundance of moisture for the ground when the spring plowing shall commence, but at the present time it renders the pasturage very poor, as the cattle are unable to get at the grass and low herbage. The snowfall is greatly appreciated as it prevents the further destruction of crops and property by prairie fires. The observer at Fort Berthold, in McLean County, reports the pasturage in that section as the poorest in many years, on account of the recent prairie fires, which have also devastated many other sections of the State.

#### METEOROLOGY AND LOCAL STATE FAIRS.

The need of personal acquaintance between the voluntary observers and the directors of the respective State services is alluded to in the Weather and Crops for January, 1896, by the director of the Illinois Service, and he states his intention to provide for such a need at an early date. On several occasions the presence of some official of the Weather Bureau at a county fair, a State fair, or a general exposition has been productive of many advantages to the Weather Bureau observers who attended such meetings. This was notably so in the case of the expositions at Atlanta and Chicago. In general, State fairs offer an important means of exhibiting, day by day, to crowds of visitors the methods of observation pursued by the Weather Bureau and the numerous ways in which its work can be made useful to the people. In recognition of this general principle a special "Board on Expositions" has been organized at the Central Office, and instruments or publications that are appropriate for exhibition will, it is hoped, always be kept on hand ready for use.

#### POSSIBLE ADVANCES IN THE WEATHER SERVICE.

We make the following extracts from an excellent address by J. R. Sage, published in the current number of the Iowa Monthly Review:

The weather has been the subject of daily observation and remark in all ages, yet the science which undertakes by rational and philosophical methods to account for the varied phenomena of the atmosphere is comparatively new. By far the greater portion of all that has been achieved in the solution of the intricate problems relating to the weather has been wrought out within the latter half of the nineteenth century. The Weather Bureau, including the State branches, was instituted to serve the people, and to do this efficiently it must be progressive, and the advances that are not only possible, but also most desirable, should be along educational and practical lines. There is need of popularizing the science of meteorology, and more widely disseminating a knowledge of the salient facts that have been learned in this new field of investigation. \* \* \* The special need of this age is science made popular and widely disseminated. To this end there is need of workers and students in this field who are in close touch with the common people and who are able to translate the most scholarly and profound scientific writings into the language of ordinary people. The scientific lore of this age can not be shut up in cloisters nor monopolized by favored classes, but must be scattered broadcast to take root and bear fruitage in the world. I am glad to make note of the fact that the Weather Service is doing excellent work along the line of popular education.

In practical horticulture success depends absolutely upon adaptation of plant or tree to the climate. And the Weather Service should furnish the necessary data for the study of the effects of climate upon all classes of vegetation.

For the advancement of both horticulture and the Weather Service, a more close and intimate relation should be established between them.